

AMENDMENTS TO THE SPECIFICATION:

Page 1, please add the following new paragraphs before paragraph [0001]:

[0000.2] CROSS-REFERENCE TO RELATED APPLICATIONS

[0000.4] This application is a 35 USC 371 application of PCT/EP 2005/050193
filed on January 18, 2005.

[0000.6] BACKGROUND OF THE INVENTION

Please replace paragraph [0001] with the following amended paragraph:

[0001] ~~Prior Art~~ **Field of the Invention**

Please replace paragraph [0002] with the following amended paragraph:

[0002] The invention is ~~based on a~~ **directed to an improved** high-pressure pump for a fuel injection system of an internal combustion engine ~~as generically defined by the preamble to claim 1.~~

Please add the following new paragraph after paragraph [0002]:

[0002.5] Description of the Prior Art

Please replace paragraph [0003] with the following amended paragraph:

[0003] One ~~[[such]]~~ high-pressure pump ~~[[is]]~~ known from German Patent Disclosure 197 29 790 A1~~[[.]]~~ ~~This high-pressure pump~~ has at least one pump element, with a pump piston guided displaceably in a cylinder bore of a housing part of the high-pressure pump and driven in a reciprocating motion. In the cylinder bore, the pump piston defines a pump work chamber, into which the pump piston, in its intake stroke, aspirates fuel via an inlet valve, and from which the pump piston in its pumping stroke positively displaces fuel. The inlet valve has a pistonlike valve member, which is guided displaceably in a valve housing

communicating with the housing part of the high-pressure pump. The valve member has a sealing face, with which it cooperates with a valve seat, embodied on the valve housing for controlling a communication of the pump work chamber with a fuel inlet. The valve member is urged in the closing direction toward the valve seat by a closing spring, disposed in the valve housing, and by the pressure prevailing in the pump work chamber, and is urged in the opening direction by the pressure prevailing in the fuel inlet. The fuel inlet discharges in the valve housing, and the valve housing together with the valve member and the closing spring forms a preassembled structural unit, which is inserted into the housing part of the high-pressure pump. Because of the separate valve housing, the high-pressure pump is complicated and thus expensive to manufacture and produce. Moreover, the valve housing covers the pump work chamber, so that between the housing part of the high-pressure pump and the valve housing, complicated sealing off from the high pressure in the pump work chamber is necessary.

Page 2, please replace paragraph [0004] with the following amended paragraph:

[0004] ~~Advantages of the Invention~~

SUMMARY AND ADVANTAGES OF THE INVENTION

Please replace paragraph [0005] with the following amended paragraph:

[0005] The high-pressure pump of the invention ~~having the characteristics of claim 1~~ has the advantage over the prior art that no separate valve housing for the inlet valve and thus no sealing off from the high pressure in the pump work chamber are necessary. For the housing part, the only additional part that must be made is the valve seat, which can be machined in a

simple way from the inside of the cylinder bore. The valve member is introduced from the inside of the cylinder bore, with its shaft leading, and the closing spring is mounted from the outside of the housing part, diametrically opposite the cylinder bore, and joined to the shaft of the valve member.

Please replace paragraph [0006] with the following amended paragraph:

[0006] **Advantageous** ~~In the dependent claims, advantageous~~ features and refinements of the high-pressure pump of the invention are ~~recited~~ **disclosed**. ~~[[The]]~~ **Another** version of ~~claim-2~~ makes an easily manufactured course of the fuel delivery possible. ~~[[The]]~~ **One** embodiment ~~of claim-4~~ enables guidance of the valve member and thus a secure sealing action of the inlet valve as well as low wear to the sealing face and the valve seat possible. ~~[[The]]~~ **A further** embodiment ~~of claim-5~~, even without guidance of the valve member, makes a secure sealing action of the inlet valve possible.

Page 3, please replace paragraph [0007] with the following amended paragraph:

[0007] ~~Drawing~~ **BRIEF DESCRIPTION OF THE DRAWINGS**

Please replace paragraph [0008] with the following amended paragraph:

[0008] Two exemplary embodiments of the invention are ~~shown in~~ **described herein below,** **with reference to the drawings, in which:** ~~drawing and described in further detail in the ensuing description. Fig. 1 shows a high-pressure pump for a fuel injection system of an internal combustion engine in a longitudinal section; Fig. 2 shows a detail, marked II in Fig. 1, of the high-pressure pump with an inlet valve in an enlarged view in a first exemplary~~

~~embodiment; and Fig. 3 shows the detail II with the inlet valve in a second exemplary embodiment.~~

Please add the following new paragraph after paragraph [0008]:

[0008.2] Fig. 1 shows a high-pressure pump for a fuel injection system of an internal combustion engine in a longitudinal section;

Please add the following new paragraph after paragraph [0008.2]:

[0008.4] Fig. 2 shows a detail, marked II in Fig. 1, of the high-pressure pump with an inlet valve in an enlarged view in a first exemplary embodiment; and

Please add the following new paragraph after paragraph [0008.4]:

[0008.6] Fig. 3 shows the detail II with the inlet valve in a second exemplary embodiment.

Please replace paragraph [0009] with the following amended paragraph:

[0009] ~~Description of the Exemplary Embodiments~~

DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please replace paragraph [0010] with the following amended paragraph:

[0010] In **the drawings** ~~Figs. 1 through 3~~, a high-pressure pump for a fuel injection system of an internal combustion engine is shown[[]] ~~The high-pressure pump~~ **which** has a multi-part pump housing 10, in which a drive shaft 12, which can be driven to rotate by the engine, is rotatably supported. The drive shaft 12 is rotatably supported in a basic body 14 of the housing 10, via two bearing points spaced apart from one another in the direction of the pivot axis 13 of the drive shaft 12. The basic body 14 of the housing can in turn be embodied in multiple parts, and the bearing points may be located in different parts of the basic body 14.

The basic body 14 comprises a material, especially lightweight metal, such as aluminum or an aluminum alloy, that has the requisite strength for supporting the drive shaft 12.

Please replace paragraph [0011] with the following amended paragraph:

[0011] In a region located between the two bearing points, the drive shaft 12 has at least one portion 16, or cam, that is eccentric to its pivot axis 13; the cam 16 may also be embodied as a multiple **lobe** cam. The high-pressure pump has at least one, or more, pump elements 18 disposed in the pump housing 10, each with a pump piston 20 that is driven in a reciprocating motion by the eccentric portion 16 or cam of the drive shaft 12, in a direction that is at least approximately radial to the pivot axis 13 of the drive shaft 12. In the region of each pump element 18, one housing part 22 connected to the basic body 14 is provided, which is embodied as a cylinder head. The housing part 22 has a flange 24, resting on an outside of the basic body 14, and an approximately cylindrical extension 26, of lesser diameter than the flange 24, protruding toward the drive shaft 12 through an opening 15 in the basic body 14.

Page 4, please replace paragraph [0012] with the following amended paragraph:

[0012] The pump piston 20 is guided tightly displaceably in a cylinder bore 28 that is embodied in the housing part 22, and with its face end remote from the drive shaft 12, the pump piston defines a pump work chamber 30 in the cylinder bore 28. The pump work chamber 30 is disposed in the region of the flange 24 of the housing part 22, and the cylinder bore 28 extends as far as the end, toward the drive shaft 12, of the extension 26 of the housing part 22. Via a fuel delivery conduit 32 extending in the pump housing 10, the pump work chamber 30 has a communication with a fuel delivery means, such as a feed pump. At the

mouth of the fuel delivery conduit 32 into the pump work chamber 30, there is an inlet valve 34 which opens into the pump work chamber 30. Via a fuel outflow conduit ~~[[306]]~~ 36 extending in the pump housing 10, the pump work chamber 30 also has a communication with an outlet, which for instance communicates with a high-pressure reservoir 110. One or preferably more injectors 120 disposed at the cylinders of the engine communicate with the high-pressure reservoir 110, and through them fuel is injected into the cylinders of the engine. At the mouth of the fuel outflow conduit 36 into the pump work chamber 30, there is an outlet valve 38 that opens out of the pump work chamber 30. The housing part 22 comprises a high-strength material, since in the pump work chamber 30, high pressure prevails during the pumping stroke of the pump piston 20. The housing part 22 may for instance comprise steel or gray cast iron.

Page 8, please replace paragraph [0017] with the following amended paragraph:

[0017] In the intake stroke of the pump piston 20, in which the pump piston together with the tappet 40 is moved radially inward by the restoring spring 48, a low pressure prevails in the pump work chamber 30, and thus the inlet valve 34 opens in that its valve member 56, with its sealing face 60, lifts from the valve seat 52, since because of the pressure prevailing in the fuel delivery conduit 32, a greater force is generated in the opening direction than the total of the force of the closing spring 64 and of the force generated by the pressure prevailing in the pump work chamber 30. From the chamber 72, when the inlet valve 34 is open, fuel flows through the annular gap 63 into the pump work chamber 30. At low pressure in the pump work chamber 30 during its filling, the outlet valve 38 is closed. In the pumping stroke of the

pump piston 20, in which the pump piston together with the tappet 40 moves radially outward, fuel in the pump work chamber 30 is compressed by the pump piston 20, so that because of the increased pressure in the pump work chamber [[24]] 30, the inlet valve 34 closes, while fuel at high pressure is pumped through the fuel outflow conduit 36, with the outlet valve 38 open, to the high-pressure reservoir 110. The valve member 56 of the inlet valve 34 is not guided; because of its convex sealing face 60 and the frustoconical valve seat 52, centering is brought about upon the closing motion of the valve member 56, so that the sealing face 60 securely seals off the valve seat 52, and the pump work chamber 30 is disconnected from the fuel delivery conduit 32.

Page 10, please add the following new paragraph after paragraph [0019]:

[0020] The foregoing relates to a preferred exemplary embodiment of the invention, it being understood that other variants and embodiments thereof are possible within the spirit and scope of the invention, the latter being defined by the appended claims.